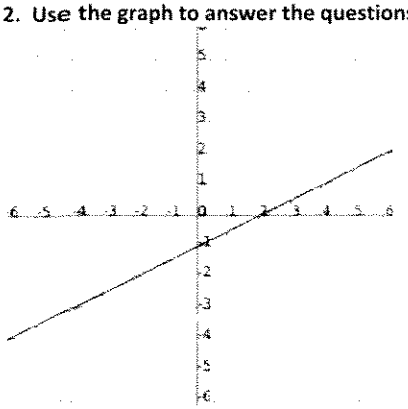
Summer 2009 Please email me if you find any mistakes. Thanks! Math 110

Answers to Study Guide for Midterm

1. Let c be the total cost (in dollars) of n tickets to a Cold Play concert. What is the dependent variable?

C

2. Use the graph to answer the questions.



a) Find $f(-4)$ This question should read "Find y when x=-4" [-3]

b) Find x when $y = 1$. [5]

c) What is the y-intercept of the line? Write your answer as an ordered pair. [(0,-1)]

d) What is the x-intercept of the line? Write your answer as an ordered pair. [(2,0)]

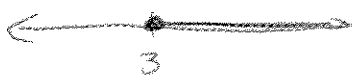
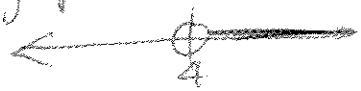
3. Evaluate the following expressions for $a = 2$, $b = -5$, $c = -4$, and $d = 10$. Show all work for credit.

a) $\frac{a}{d} \div \frac{b}{c}$	b) $b^2 - 4ac$	c) $\frac{-b-c^2}{2a}$	d) $2c^2 - 5c + 3$
$\frac{4}{25}$	57	$\frac{-11}{4}$	55

4. Simplify the expression or solve the equation, as appropriate.
Unless otherwise specified, use integers or simplified fractions only in your answers.

a) $-8 = \frac{4x}{7}$	b) $5(x-2) - (3x+6) = 6(5x+3)$	c) $-5.5 + 4.6(3.5x - 9.1)$ Round your answer to the nearest tenth.
$x = -14$	$x = -\frac{17}{14}$	$16.1x - 47.4$
d) $\frac{5}{6} + 2x + 5 - \frac{7}{9}x$	e) $\frac{2}{9}(15x + 6)$	f) $\frac{7x}{8} + \frac{1}{2} - \frac{3x}{4} = 0$
$\frac{35}{6} + \frac{11x}{9}$	$\frac{10}{3}x + \frac{4}{3}$	$x = -4$

5. Solve the inequality. Describe the solution set as in inequality, in interval notation, and in a graph.

a) $5(x-2) \geq 15$	b) $\frac{3}{4}t - \frac{1}{2} \leq \frac{1}{4}$	c) $\frac{2b-4}{3} < \frac{3b-4}{4}$
ineq: $x \geq 3$ int not: $[3, \infty)$ graph 	ineq: $t \leq 1$ int not: $(-\infty, 1]$ graph 	ineq: $b > 4$ int not: $(4, \infty)$ graph 

6. Determine whether the pair of lines is parallel, perpendicular, or neither.

$$y = \frac{6}{7}x + 10 \quad \textit{and} \quad y = -\frac{7}{6}x - 10$$

perpendicular

7. Perform the indicated operations and simplify your answers. *Show all work for credit!*
Unless otherwise specified, your answers should be an integer or simplified fraction.

a) $\frac{4}{15}+\frac{5}{9}$ $\frac{37}{45}$	b) $5[3+2(4-2)]$ 35	c) $9(4-6)^2-2(2-4)^3$ 52
d) $(-5)^2$ 25	e) $\left(\frac{3}{5}\right)^2$ $\frac{9}{25}$	f) $\frac{-15(-8)}{10-(-10)}$ 6

8. Use your calculator to perform the indicated operations. Round the result to two decimal places.

$$18.67-36.9(22.4)+12.38\div 5.72$$

-805.73

9. For the following problems, let x be a number.

a) Subtract 14 from the quotient of the number and -2.

i. Translate the English phrase into a mathematical expression.

$\frac{x}{-2}-14$

ii. Evaluate the expression for $x=-14$. Show all work for full credit.

-7

b) Two times the difference of a number and 5 is -6.

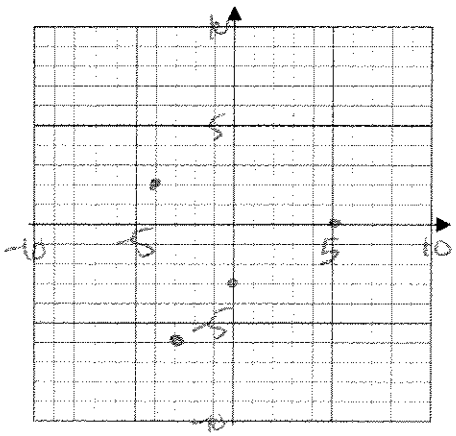
i. Translate the English phrase into a mathematical equation.

$2(x-5)=-6$

ii. Solve the equation.

$x=2$

10. Plot the ordered pairs below in a coordinate system.
$(-4,2),\ (5,0),\ (0,-3),\ (-3,-6)$



11. Use the slope formula to find the slope of the line that passes through the two given points. $(6,7)$ *and* $(8,1)$

a) Slope (Write your answer as an integer or simplified fraction): -3

b) Is the line increasing, decreasing, horizontal, or vertical?

decreasing

12. A country's oil exports decreased approximately linearly from 1070 million barrels in 1996 to 530 million barrels in 2000. Find the average rate of change of the country's oil exports per year. Write your answer in a complete sentence in the context of the problem.

-135 Every year a country's oil exports decreases by 135 million barrels

13. Let n be the average number of cars sold per week by a car dealership at t years since 1990. What does the ordered pair (15, 25) represent? Write your answer in a complete sentence.

t n

In 2005, the average number of cars sold per week by a car dealership was 25.

14. A set of points is described in the table below. Find an equation of the line that contains the points.

x	y
0	5
1	7
2	9
3	11
4	13

Equation: $y = 2x + 5$

15. Find an equation of the line containing the given pair of points. Write your answer in slope-intercept form. Use integers or simplified fractions for any numbers in your answer.

$(-2, -3)$ *and* $(-8, -7)$ $y = \frac{2}{3}x - \frac{5}{3}$

16. The percentage of mothers who smoke cigarettes during pregnancy has declined approximately linearly from 13.9% in 1995 to 12.0% in 2000. Let t be the number of years since 1995 and p be the percentage of mothers who smoke cigarettes during pregnancy.

a) Which variable is the independent variable? t

b) What is the slope? What does it mean in this situation?
$-.38$ Each year, the percentage of mothers who smoke cig. during pregnancy decreases by .38%.

c) What is the p-intercept as an ordered pair? What does it mean in this situation?
$(0, 13.9)$ In 1995, 13.9% of mothers smoked cigarettes during pregnancy

d) Find the equation of a linear model to describe the data.
$P = -.38t + 13.9$ ← use same variables as given in problem.

e) What is the t-intercept as an ordered pair? What does it mean in this situation?
In 2032, there will be no mothers smoking cigarettes during pregnancy

f) Predict the percentage of mothers who smoke cigarettes during pregnancy in 2010. Show all work and write your answer in a complete sentence. In 2010, about 8.2% of mothers will smoke during pregnancy

g) When did the percentage of mothers who smoked cigarettes during pregnancy reach 5%? Show all work and write your answer in a complete sentence. Round your answer to the nearest year.
In 2018 the percentage of mothers who smoke during pregnancy will reach 5%.

17. Consider the numbers below. Which of these numbers are the given type of number?

$\left\{\frac{4}{5}, \quad -3, \quad 0.2, \quad 0, \quad -\pi, \quad 5.8, \quad \sqrt{64}, \quad -\sqrt{5}\right\}$

a) The counting numbers are: $\sqrt{64}$

b) The negative integers are: -3

c) The integers are: $-3, 0, \sqrt{64}$

d) The rational numbers are: $\frac{4}{5}, -3, 0.2, 0, 5.8, \sqrt{64}$

e) The irrational numbers are: $-\pi, -\sqrt{5}$

f) The real numbers are: $\frac{4}{5}, -3, 0.2, 0, -\pi, 5.8, \sqrt{64}, -\sqrt{5}$

18. Use the following linear equation to answer the questions that follow.

$5.01x - 4.66y = -11.02$

a) Write the linear equation in slope-intercept form. Round to two decimal places as needed.
$y = 1.08x + 2.36$

b) Using your model from part (a), find the x-intercept. Write it as an ordered pair.
$(-2.19, 0)$

c) Using your model from part (a), find the y-intercept. Write it as an ordered pair.
$(0, 2.36)$